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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,401	07/01/2003	Jan Ma	DAVI192.001AUS	1903

20995 7590 01/24/2007
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EXAMINER

MAYEKAR, KISHOR

ART UNIT	PAPER NUMBER
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1753

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	01/24/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 01/24/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
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Office Action Summary

Application No.

10/611,401

Applicant(s)

MA ET AL.

Examiner

Kishor Mayekar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 26-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/3, 1/4, 8/4, 7/6 & 11/6</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of invention of Group I, claims 1-25 in the reply filed on 7 November 2006 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 6-16 and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gal-Or et al. (US 6,127,283) in view of either Kerkar (US 5,472,583) or Sarkar (US 6,607,645 B1). Gal-Or's invention is directed to a method of manufacturing piezoelectric products by electrophoretic deposition of ferroelectric particles. Gal-Or discloses that the process comprises the steps of forming a suspension of ceramic particles in a fluid medium; positioning a substrate in the fluid medium; depositing particles on the substrate using electrophoresis; and heat-treating the deposited particles to form

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the piezoelectric element (col. 12, line 27 through col. 13, line 49). The difference between Gal-Or and the above claims is the recited rod as the substrate for the electrophoretic deposition of the particles. Kerkar shows in a method of electrophoretically depositing ceramic particles on a substrate that the substrate is in a form of a rod or any other suitable electrode shape (col. 2, lines 39-42). Sarkar shows the same in a method of electrophoretic deposition of ceramic particles (Fig. 1). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Gal-Or's teachings as shown by either Kerkar or Sarkar because the selection of substrate shapes for the electrophoretic deposition of ceramic particles would be within the level of ordinary skill in the art.

As to the subject matter of claims 6-10 and 12, since Gal-Or discloses in col. 13, lines 44-60 the separation of the piezoelectric element from the substrate by using a consumable material and effecting the oxidation or evaporation of the consumable material during the sintering and since Sarkar shows the sintering a core bearing the deposited ceramic particles to combust the core and to fully dense the deposited ceramic particles and the sintering cycle (col. 2, lines 15-29 and Example 1), the selection of sintering cycle and the substrate (the core bearing the deposited particles) would also be within the level of ordinary skill in the art.

As to the subject matter of claim 13, since all the references disclose the mixing of the particles in the fluid medium, the selection of any of known equivalent mixing means would be also within the level of ordinary skill in the art.

As to the subject matter of each of claims 14-16 and 18-23, Gal-Or discloses it in col. 12, lines 40-53, col. 13, lines 8-18 and col. 14, lines 7-44. Further to claim 3, the selection of electric field, the duration and the temperature would be also within the level of ordinary skill in the art.

4. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gal-Or '283 as modified by either Kerkar '583 or Sarkar '645 as applied to claims 1, 2, 6-16 and 17-23 above, and further in view of Woolf et al. (US 5,108,982). The difference between the references as applied above and the instant claim is the provision of the container adapted to act as the counter-electrode. Woolf shows in a method of electrophoretic depositing ceramic particles on a substrate the provision of a container as a counter-electrode in addition to an arrangement where both a counter-electrode and a substrate electrode are inside a container (col. 5, lines 5-18). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by Woolf because the selection of any of known equivalent counter-electrode arrangement for the electrophoretic deposition of ceramic particles would be within the level of ordinary skill in the art.

As to the subject matter of claim 5, since Gal-Or discloses in col. 11, lines 62-67 for the case that the substrate is non-conductive, the non-conductive substrate is coated with a conductive layer to render it conductive and used as the electrode. A similarity exists when the container is non-conductive.

5. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gal-Or '283 as modified by either Kerkar '583 or Sarkar '645 as applied to claims 1, 2, 6-16 and 17-23 above, and further in view of Yun et al. (US 6,349,455 B1). The difference between the references as applied above and the instant claim is the provision of water as the solvent. Yun, a reference cited by Applicant, shows in a method for forming piezoelectric element using electrophoretic deposition the provision of water as one the solvent in addition to organic solvents (paragraph crossing cols. 3 and 4). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by Yun because the selection of any of known equivalent solvents for the electrophoretic deposition of ceramic particles would be within the level of ordinary skill in the art.

6. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gal-Or '283 as modified by either Kerkar '583 or Sarkar '645 as applied to claims 1, 2, 6-16 and 17-23 above, and further in view of prior art disclosed in EP 407099 A1. The

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difference between the references as applied above and the instant claims is the recited multi-layered piezoelectric element. EP '099 shows in a method of producing multilayered ceramic elements or multilayered electrostrictive/piezoelectric ceramic elements that it is known the elements comprising a plurality of layers of ceramic and a plurality of inner electrodes placed between adjacent layers of the ceramic. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by prior art in EP '099 because this would result in forming a multi-layered piezoelectric element by repeating the forming of each layer of the piezoelectric element by the electrophoretic deposition.

Conclusion

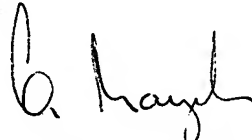
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information

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for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Kishor Mayekar
Primary Examiner
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